IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Yasuhiko (nmi) Aoki et al.
Serial No.:	10/627,548
Filing Date:	July 25, 2003
Group Art Unit:	2613
Confirmation No.:	3535
Examiner:	Christina Y. Leung
Title:	SYSTEM AND METHOD FOR COMMUNICATING OPTICAL TRAFFIC BETWEEN RING NETWORKS

Mail Stop Appeal Brief - Patents
Commissioner for Patents
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Dear Sir:

APPEAL BRIEF

Appellants have appealed to the Board of Patent Appeals and Interferences (the "Board") from the decision of the Examiner transmitted on January 2, 2008, finally rejecting Claims 1, 3-9, 11 and 13-19. Appellants filed a Notice of Appeal on April 1, 2008.

Real Party In Interest

This application is currently owned by Fujitsu Limited as indicated by an assignment recorded on May 3, 2004 in the Assignment Records of the United States Patent and Trademark Office at Reel/Frame 015311/0444.

Related Appeals and Interferences

To the knowledge of Appellants' counsel, there are no known appeals, interferences, or judicial proceedings that will directly affect or be directly affected by or have a bearing on the Board's decision regarding this Appeal.

Status of Claims

Claims 1, 3-9, 11 and 13-19 are pending in the Application and stand rejected pursuant to a final Office Action transmitted January 2, 2008 (the "Office Action") and are all presented for appeal. All claims presented for appeal are shown in Appendix A, attached hereto, along with an indication of the status of those claims.

Status of Amendments

All amendments submitted by Appellants have been entered by the Examiner.

Summary of Claimed Subject Matter

FIGURE 1 is a block diagram illustrating a system 10 in accordance with one embodiment of the present invention. In accordance with this embodiment, system 10 includes optical ring networks 12 and 14. An optical ring network may include, as appropriate, a single, unidirectional fiber, a single, bi-directional fiber, or a plurality of uni- or bi-directional fibers. In the illustrated embodiment, optical ring networks 12 and 14 each include a pair of unidirectional fibers, each transporting traffic in opposite directions. Specifically, optical ring network 12 includes a first fiber, or ring, 13 and a second fiber, or ring, 15. Optical ring network 14 includes a first fiber, or ring, 17 and a second fiber, or ring, 19. Rings 13 and 15 connect a plurality of add/drop nodes (ADNs) 18 and ring interconnect (RIC) nodes 22, and rings 17 and 19 connect a plurality of ADNs 20 and RIC nodes 22. System 10 is an optical network system in which a number of optical channels are carried over a common path in disparate wavelengths/channels. Optical networks of system 10 may be wavelength division multiplexing (WDM), dense wavelength division multiplexing (DWDM) or other suitable multi-channel networks. Optical networks of system 10 may be used as short-haul metropolitan networks, long-haul inter-city networks, or any other suitable network or combination of networks. *(Page 9, Lines 2-27)*

RIC nodes 22 are each operable to add and drop traffic to and from optical ring networks 12 and 14. As an example, each RIC node 22 may drop traffic from ring 13 of optical ring network 12 and add such traffic to ring 17 of optical ring network 14 and vice versa. Each RIC node 22 may also drop traffic from ring 15 of optical ring network 12 and add such traffic to ring 19 of optical ring network 14 and vice versa. Such adding and dropping of traffic through RIC nodes 22 may be accomplished either passively or actively. "Passively" in this context means the adding or dropping of channels without power, electricity and/or moving parts. An active device would thus use power, electricity or moving parts to perform work. In a particular embodiment of the present invention, traffic may be passively added to and/or dropped from the rings by splitting/combining, which is without multiplexing/demultiplexing, in the transport rings and/or separating parts of a signal in the ring. *(Page 10, Line 22 – Page 11, Line 8)*

The use of two RIC nodes 22 provides protection for system 10 in the event that there is an error with the ability of one RIC node 22 to effectively communicate traffic from one optical ring network to another. For example, in operation one RIC node 22 may act as a primary RIC node and may add or drop traffic between optical ring networks 12 and 14 while the other RIC node 22 may act as a secondary RIC node. The secondary RIC node may wait until there is an error with the primary RIC node before adding or dropping any traffic between optical ring networks 12 and 14. The secondary RIC node may also begin adding and dropping traffic between the optical ring networks in other situations, such as in the event of a fiber cut to one of rings 13, 15, 17 and 19. RIC nodes 22, as well as ADNs 18 and 20, may continue to circulate on a ring traffic, such as particular channels of data, that is added to or dropped from that particular ring. *(Page 11, Lines 9-26)*

FIGURE 8A illustrates a system 100 for communicating traffic from optical ring network to another, in accordance with an embodiment of the present invention. System 100 includes optical ring networks 102 and 104. Optical ring network 102 includes rings 103 and 105 which communicate traffic in different directions, and optical ring network 104 includes rings 107 and 109 which communicate traffic in different directions. FIGURE 8A only illustrates particular components of system 100 for adding traffic from optical ring network 102 to optical ring network 104. System 100 may include other components for adding traffic from network 104 to network 102. For example, each RIC node may include an additional two WSUs and rejection blocks for adding traffic from network 104 to network 102. *(Page 27, Line 20 – Page 28, Line 2)*

System 100 includes RIC nodes 110 and 112. RIC node 110 includes optical couplers 114, WSUs 118 and rejection blocks 122; and RIC node 112 includes optical couplers 116, WSUs 120 and rejection blocks 124. In operation, one of RIC nodes 110 and 112 may act as a primary RIC node while the other acts as a secondary, or protection, RIC node. For example, if RIC node 110 is acting as a primary RIC node, then it may communicate traffic between optical ring networks 102 and 104 under normal operation. Traffic communicated on ring 103 is dropped at coupler 114a. Particular channels of such traffic are selected at WSU 118b, and such channels are added to ring 107 at coupler 114c. Similarly, traffic communicated on ring 105 is dropped by optical coupler 114b, particular channels of such

traffic are selected at WSU 118a, and such channels are added to ring 109 at coupler 114d. Thus, when operational, RIC node 110 is able to add particular channels of traffic communicated on optical ring network 102 to optical ring network 104. *(Page 28, Lines 3-21)*

In a similar manner, when operational, RIC node 112 is able to add particular channels of traffic communicated on optical ring network 102 to optical ring network 104. If RIC node 112 is acting as a secondary RIC node, RIC node 112 will not become operational until there is an error or problem with the ability of traffic to be communicated from network 102 to network 104 by RIC node 110. Such an error may result from a problem with one or more components of RIC node 110 or from a fiber cut to an optical ring. In such situation, traffic communicated on ring 103 is dropped at coupler 116a, particular channels of such traffic are selected at WSU 120b, and such channels are added to ring 107 at coupler 116c. Similarly, traffic communicated on ring 105 is dropped by optical coupler 116b, particular channels of such traffic are selected at WSU 120a, and such channels are added to ring 109 at coupler 116d. *(Page 28, Line 22 – Page 29, Line 6)*

Rejection blocks 122 and 124 of RIC nodes 110 and 112, respectively, are able to prevent particular wavelengths of traffic from passing through. For example, if RIC node 110 adds traffic of a particular wavelength, for example λ_1, to optical ring network 104, then rejection blocks 122 may block λ_1 traffic from passing through such filters in order to prevent interference with the λ_1 traffic being added at couplers 114. *(Page 29, Lines 7-15)*

Rejection blocks 122 and 124 are also able to detect the presence of particular wavelengths of traffic in order to determine whether there is a problem or error with the ability of a RIC node to add traffic from one optical ring network to another. For example, if RIC node 110 is to act as a primary RIC node and RIC node 112 is to act as a secondary RIC node, then rejection blocks 124 of RIC node 112 can detect whether the particular traffic that is supposed to be added to rings 107 and 109 by RIC node 110 during normal operation is present on such rings. If rejection blocks 124 do not detect such traffic, then there may be a problem or error with RIC node 110. In such case, RIC node 112 may fulfill its role as a

secondary, or protection, RIC node and begin to add such traffic to rings 107 and 109 because of the failure of RIC node 110 to do so. *(Page 29, 16-31)*

In the illustrated embodiment, RIC node 212 operates as a primary RIC node, and RIC node 214 operates as a secondary RIC node. Because RIC node 214 operates as a secondary RIC node, it does not add traffic to rings 210 and 211 when RIC node 212 is adding traffic to such rings. This is the case because the WSUs of RIC node 214 are off or otherwise inactive to prevent such traffic from being added to rings 210 and 211. In other embodiments, RIC node 214 could operate as a primary node, and RIC node 212 could operate as a secondary RIC node. In such situation, RIC node 212 would not add traffic to rings 210 and 211 when RIC node 214 is adding traffic to such rings. *(Page 35, Lines 11-23)*

In operation, if a problem or error arises with the ability of RIC node 212 to effectively add traffic from rings 206 or 208 to rings 210 or 211, respectively, then RIC node 214 will recognize that RIC node 212 is not adding such traffic. Such recognition may be made by certain components of RIC node 214, such as one or more rejection blocks. The error with the ability of RIC node 212 to effectively add traffic may result from a malfunctioning WSU or other component problem, such as a loss of power. RIC node 214 will then begin adding traffic from rings 206 and 208 to rings 210 and 211, respectively, as protection. Thus, system 200 remains able to communicate traffic from origin node 201 to destination node 203 despite RIC node errors. *(Page 35, Line 24 – Page 36, Line 5)*

With regard to the independent claims currently under appeal, Appellants provide the following concise explanation of the subject matter recited in the claim elements. For brevity, Appellants do not necessarily identify every portion of the Specification and drawings relevant to the recited claim elements. Additionally, this explanation should not be used to limit Appellants' claims but is intended to assist the Board in considering the appeal of this Application.

For example, independent Claim 1 recites the following:

A system for communicating optical traffic between ring networks, comprising:

a first optical ring network and a second optical ring network, each optical ring network operable to communicate optical traffic comprising a plurality of wavelengths (e.g., Page 9, Lines 2-27; Page 10, Line 22 – Page 11, Line 8);

a first ring interconnect (RIC) node and a second RIC node, each RIC node coupled to the first and second optical ring networks (e.g., Page 9, Lines 2-27; Page 10, Line 22 – Page 11, Line 8);

the first RIC node operable to communicate optical traffic between the first and second optical ring networks (e.g., Page 9, Lines 2-27; Page 10, Line 22 – Page 11, Line 8);

wherein the second RIC node is inactive under normal system operation and not operable to communicate optical traffic between the first and second optical ring networks when the first RIC node is able to communicate optical traffic between the first and second optical ring networks (e.g., Page 28, Line 22 – Page 29, Line 6; Page 29, Lines 16-31; Page 35, Lines 11-23);

the second RIC node comprising a rejection block operable to detect traffic of one or more wavelengths to determine when the first RIC node is unable to communicate optical traffic between the first and second optical ring networks (e.g., Page 27, Line 20 – Page 28, Line 2; Page 28, Lines 3-21; Page 28, Line 22 – Page 29, Line 6; Page 29, Lines 7-31); and

the second RIC node operable to communicate optical traffic between the first and second optical ring networks when the first RIC node is unable to communicate optical traffic between the first and second optical ring networks(e.g., Page 11, Lines 9-26; Page 28, Line 22 – Page 29, Line 6; Page 29, Lines 16-31; Page 35, Line 24 – Page 36, Line 5).

As another example, independent Claim 11 recites the following:

A method for communicating optical traffic between ring networks, comprising:

communicating optical traffic comprising a plurality of wavelengths through a first optical ring network and through a second optical ring network (e.g., Page 9, Lines 2-27; Page 10, Line 22 – Page 11, Line 8);

communicating optical traffic between the first and second optical ring networks at a first ring interconnect (RIC) node (e.g., Page 9, Lines 2-27; Page 10, Line 22 – Page 11, Line 8);

wherein a second RIC node is inactive under normal system operation and not operable to communicate optical traffic between the first and second optical ring networks when the first RIC node is able to communicate optical traffic between the first and second optical ring networks (e.g., Page 28, Line 22 – Page 29, Line 6; Page 29, Lines 16-31; Page 35, Lines 11-23);

detecting traffic of one or more wavelengths at a rejection block to determine when the first RIC node is unable to communicate optical traffic between the first and second optical ring networks (e.g., Page 27, Line 20 – Page 28, Line 2; Page 28, Lines 3-21; Page 28, Line 22 – Page 29, Line 6; Page 29, Lines 7-31); and

communicating optical traffic between the first and second optical ring networks at the second RIC node when the first RIC node is unable to communicate optical traffic between the first and second optical ring networks (e.g., Page 11, Lines 9-26; Page 28, Line 22 – Page 29, Line 6; Page 29, Lines 16-31; Page 35, Line 24 – Page 36, Line 5).

Grounds of Rejection to be Reviewed on Appeal

1. Appellants request that the Board review the Examiner's rejections of Claims 1, 3-5, 7-9, 11, 13-15 and 17-19 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 7,072,580 B2 issued to Arecco et al ("*Arecco*").

2. Appellants request that the Board review the Examiner's rejections of Claims 6 and 16 under 35 U.S.C. § 103(a) as being unpatentable over *Arecco* in view of U.S. Patent No. 5,612,805 issued to Fevrier et al ("*Fevrier*").

Argument

I. The Examiner's Rejections of Claims 1, 3-5, 7-9, 11, 13-15 and 17-19 are Improper

The Office Action rejects Claims 1, 3-5, 7-9, 11, 13-15 and 17-19 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 7,072,580 B2 issued to Arecco et al ("*Arecco*").

Claim 1 recites a system for communicating optical traffic between ring networks that includes:

> a first optical ring network and a second optical ring network, each optical ring network operable to communicate optical traffic comprising a plurality of wavelengths;
>
> a first ring interconnect (RIC) node and a second RIC node, each RIC node coupled to the first and second optical ring networks;
>
> the first RIC node operable to communicate optical traffic between the first and second optical ring networks;
>
> wherein the second RIC node is inactive under normal system operation and not operable to communicate optical traffic between the first and second optical ring networks when the first RIC node is able to communicate optical traffic between the first and second optical ring networks;
>
> the second RIC node comprising a rejection block operable to detect traffic of one or more wavelengths to determine when the first RIC node is unable to communicate optical traffic between the first and second optical ring networks; and
>
> the second RIC node operable to communicate optical traffic between the first and second optical ring networks when the first RIC node is unable to communicate optical traffic between the first and second optical ring networks.

Thus, Claim 1 recites wherein the second RIC node is inactive under normal system operation and not operable to communicate optical traffic between the first and second optical ring networks when the first RIC node is able to communicate optical traffic between the first and second optical ring networks. Claim 11 recites similar elements. The Office Action suggests that *Arecco* discloses these elements. The Office Action contends that nodes E and E' of *Arecco* are the claimed second RIC node. *See* Office Action, pages 2-3. Nodes E and E' of *Arecco* receive and drop signals between Network 1 and Network 2 of *Arecco* in a

normal operative condition even when the elements of *Arecco* contended to be a first RIC node (nodes D and D') are receiving and dropping signals between Network 1 and Network 2. *See, e.g., Arecco*, col. 27, lines 3-52. *Arecco* does not disclose a second RIC node inactive under normal system operation and not operable to communicate optical traffic between the first and second optical ring networks when a first RIC node is able to communicate optical traffic between the first and second optical ring networks.

In response to Appellants previous remarks pointing this out, the Office Action suggests that *Arecco* includes this element and states that:

> Specifically, Figure 21 shows normal system operation, wherein nodes E and E' are not operable to communicate optical traffic between the rings (column 26, lines 37-67; column 27, lines 1-57). Although Arecco et al. disclose that nodes E and E' pass signals from input ports to output ports in the normal system operation as shown in Figure 21, Arecco et al. specifically discloses that in the normal operation, traffic is communicated between the rings via nodes D and D', not via nodes E and E'.

Office Action, page 8. In response, Appellants note that *Arecco* <u>specifically discloses</u> that in normal system operation nodes D and D' <u>and</u> nodes E and E' communicate traffic between the rings – "<u>[u]nder normal operative conditions</u>, signal S1 is inserted into the first ring network (Network 1) by node B, passes through node C and is received by node D, where it is split into a first and a second fraction (50% of power) <u>which are sent towards nodes E</u> and D'." *Arecco*, col. 26, lines 61-66 (emphasis added). This is also clearly indicated at column 27, lines 4-50 of *Arecco*:

> In more detail, signal routing within the different nodes <u>during normal operative conditions</u> are the following:
>
> . . .
>
> Node E
>
> Signal S_1 is received via the first receiving transponder RxT_1 (λ_x) and it is dropped at the second output OUT_2.
>
> . . .
>
> Node E'
>
> Signal S_1 is received via the first input IN_1 and transmitted via the first transmitting transponder TxT_1 (λ_x).

Arecco, col. 27, lines 4-50 (emphasis added). There is no disclosure that <u>under normal system operation</u> a second RIC node (contended by the Office Action to be nodes E and E') <u>is inactive and not operable to</u> communicate optical traffic between the first and second optical

ring networks when the first RIC node is able to communicate optical traffic between the first and second optical ring networks. There is no disclosure in *Arecco* that nodes E and E' are inactive under normal system operation.

Therefore, Appellants respectively submit that Claims 1 and 11 are patentable over the cited art used in the rejections and request that the Board overturn the rejections of these claims.

Claims 3-5 and 7-9 each depends from Claim 1, and Claims 13-15 and 17-19 each depends from Claim 11. Thus, for at least the reasons discussed above with respect to Claims 1 and 11, Appellants respectfully request that the Board overturn the rejections of Claims 3-9 and 13-19.

II. <u>The Examiner's Rejections of Claims 6 and 16 are Improper</u>

The Office Action rejects Claims 6 and 16 under 35 U.S.C. § 103(a) as being unpatentable over *Arecco* in view of U.S. Patent No. 5,612,805 issued to Fevrier et al ("*Fevrier*").

Claim 6 depends from Claim 1, and Claim 16 depends from Claim 11. Thus, for at least the reasons discussed above with respect to Claims 1 and 11, Appellants respectfully request that the Board overturn the rejections of Claims 6 and 16.

CONCLUSION

Appellants have demonstrated that the present invention, as claimed, is clearly distinguishable over the prior art cited by the Examiner. Therefore, Appellants respectfully request the Board of Patent Appeals and Interferences to reverse the Examiner's final rejection of the pending claims and instruct the Examiner to issue a notice of allowance of all pending claims.

The Commissioner is hereby authorized to charge $510.00 in payment for this Appeal Brief, any other fee and credit any overpayment, to Deposit Account No. 02-0384 of Baker Botts L.L.P.

Respectfully submitted,

BAKER BOTTS L.L.P.
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Date: June 2, 2008

CORRESPONDENCE ADDRESS:

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Appendix A: Claims on Appeal

1. (Previously Presented) A system for communicating optical traffic between ring networks, comprising:

a first optical ring network and a second optical ring network, each optical ring network operable to communicate optical traffic comprising a plurality of wavelengths;

a first ring interconnect (RIC) node and a second RIC node, each RIC node coupled to the first and second optical ring networks;

the first RIC node operable to communicate optical traffic between the first and second optical ring networks;

wherein the second RIC node is inactive under normal system operation and not operable to communicate optical traffic between the first and second optical ring networks when the first RIC node is able to communicate optical traffic between the first and second optical ring networks;

the second RIC node comprising a rejection block operable to detect traffic of one or more wavelengths to determine when the first RIC node is unable to communicate optical traffic between the first and second optical ring networks; and

the second RIC node operable to communicate optical traffic between the first and second optical ring networks when the first RIC node is unable to communicate optical traffic between the first and second optical ring networks.

2. (Canceled)

3. (Original) The system of Claim 1, wherein the first RIC node is operable to:

receive optical traffic from the first optical ring network;

passively pass through a first copy of the optical traffic along the first optical ring;

drop a second copy of the optical traffic;

select one or more wavelengths of the dropped optical traffic; and

communicate the one or more wavelengths to the second optical ring network.

4. (Original) The system of Claim 3, wherein the second RIC node is operable to:

determine when the first RIC node is unable to communicate optical traffic between the first and second optical ring networks;

receive the first copy of the optical traffic from the first RIC node;

passively pass through a third copy of the optical traffic along the first optical ring;

drop a fourth copy of the optical traffic;

select one or more wavelengths of the dropped optical traffic; and

communicate the one or more wavelengths to the second optical ring network when the first RIC node is unable to communicate optical traffic between the first and second optical ring networks.

5. (Original) The system of Claim 1, wherein the first and second RIC nodes each comprise a wavelength select unit operable to select one or more wavelengths of optical traffic for communication between the first and second optical ring networks.

6. (Original) The system of Claim 5, wherein at least one wavelength select unit comprises a tunable filter array comprising a first number of tunable filters for passing a first number of wavelengths of optical traffic for communication between the first and second optical ring networks.

7. (Previously Presented) The system of Claim 5, wherein at least one wavelength select unit comprises a second number of switches for selectively forwarding a second number of wavelengths of optical traffic for communication between the first and second optical ring networks.

8. (Original) The system of Claim 1, wherein the second RIC node is operable to communicate optical traffic between the first and second optical ring networks when the first RIC node is unable to perform such communication due to a failure of the first RIC node.

9. (Original) The system of Claim 1, wherein the second RIC node is operable to communicate optical traffic between the first and second optical ring networks when the first RIC node is unable to perform such communication due to a fiber cut to the first optical ring network.

10. (Canceled)

11. (Previously Presented) A method for communicating optical traffic between ring networks, comprising:

communicating optical traffic comprising a plurality of wavelengths through a first optical ring network and through a second optical ring network;

communicating optical traffic between the first and second optical ring networks at a first ring interconnect (RIC) node;

wherein a second RIC node is inactive under normal system operation and not operable to communicate optical traffic between the first and second optical ring networks when the first RIC node is able to communicate optical traffic between the first and second optical ring networks;

detecting traffic of one or more wavelengths at a rejection block to determine when the first RIC node is unable to communicate optical traffic between the first and second optical ring networks; and

communicating optical traffic between the first and second optical ring networks at the second RIC node when the first RIC node is unable to communicate optical traffic between the first and second optical ring networks.

12. (Canceled)

13. (Original) The method of Claim 11, further comprising:

receiving optical traffic from the first optical ring network at the first RIC node;

passively passing through a first copy of the optical traffic at the first RIC node along the first optical ring;

dropping a second copy of the optical traffic at the first RIC node;

selecting one or more wavelengths of the dropped optical traffic at the first RIC node; and

communicating the one or more wavelengths to the second optical ring network at the first RIC node.

14. (Original) The method of Claim 13, further comprising:

determining when the first RIC node is unable to communicate optical traffic between the first and second optical ring networks at the second RIC node;

receiving the first copy of the optical traffic from the first RIC node at the second RIC node;

passively passing through a third copy of the optical traffic at the second RIC node along the first optical ring;

dropping a fourth copy of the optical traffic at the second RIC node;

selecting one or more wavelengths of the dropped optical traffic at the second RIC node; and

communicating the one or more wavelengths to the second optical ring network at the second RIC node when the first RIC node is unable to communicate optical traffic between the first and second optical ring networks.

15. (Original) The method of Claim 11, further comprising selecting one or more wavelengths of optical traffic for communication between the first and second optical ring networks at a wavelength select unit of the first RIC node.

16. (Original) The method of Claim 15, further comprising filtering a first number of wavelengths of optical traffic for communication between the first and second optical ring networks at a tunable filter array of the wavelength select unit.

17. (Previously Presented) The method of Claim 15, further comprising selectively forwarding a second number of wavelengths of optical traffic for communication between the first and second optical ring networks at a second number of switches of the wavelength select unit.

18. (Original) The method of Claim 11, wherein communicating optical traffic between the first and second optical ring networks at a second RIC node when the first RIC node is unable to communicate optical traffic between the first and second optical ring networks comprises communicating optical traffic between the first and second optical ring networks at a second RIC node when the first RIC node is unable to perform such communication due to a failure of the first RIC node.

19. (Original) The method of Claim 11, wherein communicating optical traffic between the first and second optical ring networks at a second RIC node when the first RIC node is unable to communicate optical traffic between the first and second optical ring networks comprises communicating optical traffic between the first and second optical ring networks at a second RIC node when the first RIC node is unable to perform such communication due to a fiber cut to the first optical ring network.

20. (Canceled)

Appendix B: Evidence

NONE

Appendix C: Related Proceedings

NONE